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STRUCTURE AND ABSOLUTE STRUCTURE BY 3D ELECTRON DIFFRACTION: AN INTRODUCTION

Lukáš Palatinus, FZU Prague, e-mail: palat@fzu.cz

3D electron diffraction is a technique that allows the crystal structure determination by single-crystal diffraction on micro- and nanocrystals. Since its birth almost two decades ago, it has developed from a niche technique barely able to produce a rough structure model to a well-developed method allowing all types of crystallographic investigations, including the determination of hydrogen positions and charge density studies. The key difference between x-ray and electron diffraction is the strong interaction between electrons and atoms, leading to dynamical diffraction effects. These effects make the structure analysis from electron diffraction much more challenging than from x-ray diffraction, but, at the same time, offer some advantages. A key advantage of dynamical diffraction is that it significantly violates Friedel's law, enabling the determination of the absolute structure of crystals with high sensitivity and reliability.